

THE
PHYSICAL SUFFERINGS
OF THE POOR

VIEWED FROM A
SANITARY AND SOCIOLOGICAL STANDPOINT

BY
J. T. REID, M.D.

WITH
INTRODUCTORY NOTES
BY

D. H. MacVICAR, D.D., LL.D.

*Principal Presbyterian College,
Montreal,*

AND
PROF. SCRINGER, M.A., D.D.



WILLIAM DRYSDALE & CO.,
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INTRODUCTION.

These articles by Dr. Reid deal with questions of vital importance, and he does well to issue them in a more permanent form than that in which they first appeared.

They contain much valuable information, lucidly presented, and should be widely read with the appreciation and deference due to the utterances of a well-qualified medical practitioner, of considerable experience.

Social questions are now deservedly attracting much attention, and it is a cause for thankfulness that physicians are becoming public teachers on sanitary subjects as well as on the general laws of health.

This is both a legitimate and humane use of their professional knowledge. It is well to fight disease by specific remedies, but it is still better to prevent it by inducing people to pursue rational courses of conduct, and to establish in their houses and surroundings, hygienic conditions which are in a great measure safeguards against its ravages.

Even in the most advanced sections of society, there is yet much to be done in order to secure this beneficent end. The concerted action of all true social reformers is needed, and, therefore, the silence of those most competent to speak, whether Christian ministers, physicians, or civic officers, is much to be regretted.

My hope is that Dr. Reid's articles may stimulate inquiry and discussion, and lead to practical action, in the cities, towns and villages of our Dominion, where it is so manifestly needed.

D. H. MACVICAR.

MONTREAL, December, 1898.

Dr. Reid's papers on Sanitary Science are well written and show an enthusiasm for the material welfare of the masses that might well stimulate the authorities in our great cities to some practical action. Of course something more is needed for the salvation of the poor than sanitary measures, but there can be no complete salvation without them.

JOHN SCRIMGER, D.D.

PREFACE.

A Christian Minister who is the pastor of one of the leading churches of London, Eng., says:—"The Church in her neglect to inculcate in the hearts of her members that fundamental principle of Christianity—man's duty to his neighbor—is in a measure untrue to the terms of her high commission, and is thereby giving proof to the world that she is declining in usefulness. Should this course be continued, the future history of our present Church will be no exception to the general rule that, by a process of natural law, all things that have outlived their usefulness are permitted to atrophy, and ultimately to be superseded by higher forms."

Although this view may be extreme, yet one cannot but see that the poor continue to hunger for that sympathy which they do not receive from us in an adequate degree, as well as for the bread which they are too often unable to earn.

We are not doing all that Christ would have His followers do towards the mitigation of the untold sufferings of our brethren in the slums—sufferings largely due to poverty, forced upon honest and industrious men and women by social and economic conditions beyond their control.

These articles, first published in *The Presbyterian Review*, appear in the present form, with the hope that they may in some slight degree emphasize the truth, that loyalty to Christ should manifest itself not only in love to Him, but also in love to our neighbor.

J. T. R.

MONTREAL, December, 1898.

INTRODUCTORY.

In replying to a deputation from the Edinburgh Presbytery, which in 1854 requested Lord Palmerston, as Prime Minister, to proclaim a fast, in order that the ravages of cholera, then epidemic, might be stayed, that apparently irreverent but practical and scientific statesman expressed the opinion that nature had provided certain laws for the protection of the health of the people, and that no duration of a fast could expiate the breach of those laws.

Many able sermons and many elaborate volumes have been written by worthy men to reconcile science and religion. But between true science and true theology there has always been perfect harmony. True science is the true conception of nature and of natural law, which were in the beginning created by God; true theology is the true conception of the laws of God in the spiritual world. There can be no conflict either between two spheres of life or between two systems of law of which the same unchangeable God is the Creator. The conflicts of the past have been waged between scientists, who have too often been unscientific, and theologians, whose interpretations of God's Word have at times been narrower than those of theologians of the present day. The seeming contradictions between science and religion have existed only within the narrower limits of the human mind. Theologians have at times impugned the truth of principles of natural science which can be comprehended only by scientists; and scientists have too often denied the existence of that spiritual life which can be discerned only by the spiritual.

If Lord Palmerston did not believe in a God who was the designer of natural law, he could not see that the laws of nature were the laws of God; and the members of the Edinburgh Presbytery could not comprehend his reference to nature's protection of human life—by natural law—because they were not familiar with the laws of Sanitary Science.

The human body being the handiwork of God, all influences which tend towards the development of physical man are in harmony with His will; and any human customs or environments whose influence retards that development are in opposition to His will. A series of articles on "Public Health" should not therefore seem out of place in a religious

journal. Jesus not only "Preached the doctrine of the Kingdom," but went about "healing all manner of sickness and all manner of disease among the people."

While these articles will refer to public health in general, they will deal more especially with that of the poor, amongst whom the comparative death rates are so extremely high that they are a cause of some anxiety to all philanthropists.

Sanitary Science is as old as the days of Moses. Hygienic measures, as exemplified in the Mosaic code, account for the extraordinary immunity of the Jews from the recurring epidemics of the Middle Ages, for the comparatively low death-rates amongst that people in our own day, for their greater comparative longevity, and for their continued existence as a people, after so many centuries of ban and persecution.

In the code of Lycurgus, sanitary measures were prominent, yet the Greeks knew nothing of Sanitary Science. They accepted plague and pestilence as manifestations of offended deities. Their care and cultivation of their bodies, however, made them the civilizers of their own age and the exemplars of ours.

The sanitary measures of the Romans, as seen amongst the ruins of the Campagna, their Cloaca Maxima, and the aqueduct by which they supplied their city with the pure spring water of the hills, 30 miles distant, have rarely been equalled, never surpassed in modern times; and yet those who have studied the causes of the decline and ultimate fall of that Empire, attribute that fall in no small degree to the epidemics which repeatedly decimated the population in the early centuries.

When one reads of the insanitary condition of the houses of the Europe of the Middle Ages, he is not surprised in reading of epidemics such as the "black death" of the 14th century, which overran all Europe, bringing death to 25,000,000 of people—one-fourth of the population.

When in 1666, the plague was stayed in London by the "great fire," which swept away the overcrowded and insanitary houses, men began to see glimpses of the principles of Sanitary Science. Yet during all the ensuing two centuries there seems to have been very little, if any, application of those principles in the sanitation of cities. Even at so late a period as the 17 years between 1837 and 1854, Glasgow had six epidemics of cholera and typhus fever; and during that 17 years, out of every 1000 of the population, 295 died.

Of the British soldiers lost in the Crimean War, only 17 per cent. died in battle and from wounds received in battle, while 83 per cent. died of cholera and other diseases produced by insanitation.

About the middle of the present century, the principles of Sanitary Science, of which men had seen glimpses 200 years previously, began to be applied. It was about that time that Lord Palmerston taught the people of Edinburgh the lesson referred to above.

THE UNNATURALNESS OF LIFE IN LARGE CITIES.

Of the many phases of present sociological questions, that of the public health of the poor is of paramount importance. In comparison with this question, financial and all other sociological problems are secondary. Not only is this question one of vital importance to the poor themselves, but from a humanitarian standpoint, it is a vital question with all true philanthropists. Even from the standpoint of self-interest it should be studied by the wealthy. One Fifth Avenue, New York, the death rate is of course much lower than that of Ward XI. in the same city, and no one can say how much lower the death rate of the former would be were it not for the zymotic (infectious) diseases which very largely account for the high death rate of the latter. When in "Alton Locke" Charles Kingsley tells of the infection of the house of the rector by the contagion conveyed from the house of the poor tailor, he gives an instance similar to thousands of cases in the annual death-rate of every large city. From a sanitary standpoint it is to every man's own interest to be his brother's keeper.

And from a patriotic standpoint this question is one of importance. Gladstone says:—"The noblest work of the statesman is that done to raise the standard of public health." Carlyle says:—"The value of the population is the most important factor in national wealth. The greatest state is that which produces the brawniest breed of men." Ruskin says:—"The veins of true wealth are purple, not in rock but in human flesh. The divine intent of all wealth is the production of sturdy men and full-breasted, bright-eyed, happy-hearted, women and children." Prof. Seeley says:—"The health of the people is the essential factor in national prosperity, hence prevailing disease tends not only to deterioration of the race but to national decline. Rome failed with the failure of her crops—of men."

Lord Lytton says:—"Man is born on a battle-field. His own mother—fierce nature herself—is his foe. Her snows fall to freeze him; her suns burn to brand; her rocks rise to crush; while the lion and leopard lurk to rush on their startled invader." Now the phrases—"his own mother" and "fierce nature" are a contradiction in terms. Saying that nature is at enmity with man is merely saying that she is at enmity with herself—man being a part of nature. When man ignores the laws of nature, which are the laws of God, he becomes not only his own enemy but the enemy of his race. Man has ignored these laws in all ages and continues to do so. True, he does so ignorantly, as a rule, but too often he does so wilfully. Man himself, not nature, is the enemy of man. Even the lion and leopard, which are merely representatives of the age of violence (an age which is gradually passing away) will become extinct with the extinction of their jungle lurking places.

For the safety of human life nature provides a system of natural sanitation which would be efficient if her laws were known and honored, and if her beneficent designs were not frustrated by the concentration of human life in large and dense centres of population, a condition which is the direct result of our present economic system.

Having made the discovery of the germ theory of zymotic disease, Pasteur in his enthusiasm said:—"It is now in the power of man to cause infectious diseases to disappear from the face of the earth." When Lister, as a direct result of Pasteur's discovery, began to apply that principle to surgery, he introduced a system which has been the means of saving the lives of millions of human beings, yet that system is merely a small part of the system of universal hygiene which nature has been practising since natural laws were first framed.

Many of the lower forms of life are nature's workmen in this system of sanitation, acting, as they do, as scavengers, devouring dead organic matter either before or after the setting in of the process of decomposition, and in this way protecting the living from the dead. Decomposition itself is nature's plan for the destruction of organic waste matter, a process which is effected by the agency of lower organisms, some of which are visible to the naked eye, many of which are visible only under a microscope. The atmosphere supplies the oxygen and nitrogen for the oxidation and nitrification of the products of decomposition. By a process yet unknown to scientists, sunlight acting upon the oxygen and upon the aqueous vapor of the atmosphere, forms ozone, the most powerful

oxidizer. Ozone is formed also by the action of electricity upon the oxygen of the air during thunder-storms. Then the rains fall, flushing from the surface of the earth and from the air the products of these processes.

And a very necessary and very important final step is the destruction of the pathogenic germs, the agents in the process of decomposition, which, during that process, increase in million-fold proportion, and would if not destroyed be a menace to human life. For some years before it was clearly known just how sunlight acted in the destruction of pathogenic germ-life it was known that sunlight was a germicide. During his recent researches Prof. Ramsay has discovered that the violet and the ultra-violet rays of light, acting upon organic matter, produce peroxide of hydrogen, one of the most effective germicides.

There are some things in connection with the action of sunlight which scientists do not yet clearly understand. Future scientific investigation concerning the action of sunlight upon argon and krypton, the elements of the atmosphere recently discovered by Ramsay, will probably reveal more clearly the beneficent provisions of nature for the well-being of man.

Hippocrates said:—"In order to enjoy good health man must lead a natural life. The farther he removes himself from nature, the worse will be his general health. The chief ends to health are pure air, pure water, pure and sufficient food, cleanliness, rest, warmth, exercise and ease of mind." During the intervening two thousand years medical science has made no change in that list of essentials. Were men living in harmony with nature's laws all these essentials would be secured, but the present overgrowth of cities renders this impossible.

We shut out from our cities the lower forms of animal life, nature's scavengers, and substitute sanitary officers who, as a rule, do their work less efficiently and much less faithfully. We build high buildings upon both sides of narrow streets, thus preventing the free supply of nature's disinfecting sunshine. We permit refuse organic matter to accumulate upon our streets, more especially in those parts of the city inhabited by the poor. This matter forms culture beds for toxic germs which are blown with the dust to all parts of the city. We cover over acres of ground with wooden sidewalks under which the accumulated *debris* of successive decades is permitted to continue its function of germ culture under the most favorable circumstances, protected as it is from the rains, fresh air and sunshine. When the material

of this pavement is itself in a semi-decayed state, as it usually is in the poorer parts of our cities, this evil is much increased. The late Astronomer Royal, of Ireland, said:—"Of all the sunshine radiated throughout the solar system not a single ray is lost." Such was the design of nature, but in the modern city many a ray is lost.

With a wider knowledge of the fundamental principles of Sanitary Science in the minds of men, one would expect to find all our large cities well supplied with parks and squares where might grow plants and shrubs and flowers and trees, which in addition to the benign influence of their beauty upon the aesthetic nature of man, purify the atmosphere from the baneful gaseous products of animal life, and, at the same time, replenish the store of vitalizing oxygen in the atmosphere; where little children might find more inviting and less pernicious play-grounds than lanes, yards and dusty streets; where men and women after a day of toil in shop and factory and kitchen might find pure air and recreating rest; and where the people might for a time free themselves from the degenerating artificialness of city life and come into elevating contact with the beauties of nature. London and other European centres are liberally supplied with such squares and parks, but in our Canadian and American cities, where real estate is too often of more value than human life, their number is far too small, while in some cities a popular agitation is at times necessary in order to retain the very small number which they now have.

THE IMPURE WATER SUPPLY OF CITIES.

In the towns and cities of China, the most efficient health officers are the gardeners and small farmers, who collect the garbage and other refuse matter found in the lanes, yards and streets, and haul this home to be used as a fertilizer for their land. An American tourist says that the fertility of the land contiguous to the populous centres of China proves that there is no other land-fertilizer superior to the detritus of a city. The same writer says that Paris and London annually throw millions into the sea.

The Chinese method is nature's plan for the replenishing of the soil and for the protection of human life by the safe disposal of organic waste. In addition to the purifying effects of air and sunshine, to which garbage is exposed when spread over the land as a fertilizer, it is brought into contact with disinfectants and deodorants which the soil itself contains.

We are begining to imitate nature's plan. The 5000 acre sewage farm at Paris was once barren sand. The beautiful flowers of Covent Garden are grown upon a sewage farm. The College of St. Laurent, Montreal, has recently adopted this method for the disposal of sewage and garbage, while the City of Montreal is at present considering the adoption of that system.

Of course it is impracticable to dispose of all the detritus of large cities in this way, therefore we send it by stream and river to the sea. Now in the sea it does little harm, being there diluted by the waters of the sea and purified by the salt; but the human life along the streams, which carry it to the sea, suffers. This system of the pollution of streams was stigmatized by the late Ernest Hart as "the opprobrium of Sanitary Science, in short a sanitary crime." In a sample of water taken from the Ottawa river a few miles above the City of Ottawa there were found only 20 bacteria in the cubic centimetre. In a sample taken from that river a few miles below that city there were found 1530.

Of the typhoid fever of England and Wales the *British Medical Journal* states that 40 per cent. is due to the eating of shell-fish found in coast waters contaminated by sewage. Since this is true of the shell-fish, what can be said of the water of the streams into which the sewers empty, and which, when used by the people, has neither been diluted nor purified by the salt coast waters where the shell-fish are found (?)

In a small village of New York State, situated on the head waters of the Mohawk river, there occurred a short time ago a few sporadic cases of typhoid fever. During the ensuing six months, every town on the Mohawk below that village, and every town on the Hudson below the mouth of the Mohawk, whose inhabitants used river water, had an epidemic of that disease. The origin of a recent epidemic of typhoid fever at Windsor, Ontario, was traced to a brewery stable, on the bank of the river, a few miles above the town, where, during a freshet, the river water used by the people came into contact with a pile of manure, one of the most prolific culture-beds for pathogenic germs.

In England and Wales, from 1871 to 1893, there were 206 extensive epidemics of this disease, involving grievous expense, much untold mental and physical suffering, together with the loss of thousands of lives. Since that period £1,000,000 has been expended in England and Wales in the purification of streams, with results so satisfactory, that in 1897 Ernest Hart estimated that already, as a direct result

of that expenditure, the population of England and Wales was 1,000,000 more than it would otherwise have been.

Nature's plan is filtration. In this respect the Romans of 2,000 years ago were wiser than we. They supplied their city with the water from the hills—nature's filters—which were thirty miles distant. But we too are beginning to imitate nature. In several American cities the system of filtration has been adopted. In Lawrence, Mass., that system has reduced the death-rate from typhoid fever 60 per cent.

If Galen were to revisit the earth and find the inhabitants of highly cultured cities using water such as the citizens of our cities must use, he might doubt whether much advance had been made in civilization during the intervening centuries.

We are confidently told by the officers of health departments of the settling basins through which the supply of water passes on its way to the reservoirs, and where it is said, the impurities are separated by sedimentation. The comparatively small percentage of the impurities which may be separated by sedimentation remains in the settling basins and comes into contact with subsequent supplies of water, so that it is questionable whether the water in the reservoirs is purer or more impure than it was before its alleged purification by sedimentation. But the more serious phase of this question is the fact that in every large city every year there are much suffering and serious death-rates from typhoid fever, and that a large majority of the cases are caused by the impurities of the water which is used by the people.

With the development of a higher public intelligence and a more highly educated public conscience the real worth of human life will be more fully and more clearly appreciated. When that time shall have come more humane laws for the greater protection of human life will be framed and enforced.

Even thoroughly equipped systems for the purification of streams for filtration and for sewage farms would not counteract the unnatural concentration of human life in large and densely populated centres; but during the present age it would be impossible for our legislators to recognize the people's inherent right to the soil; therefore the best that can be done is to strive for the attainable, leaving present impossibilities to be accomplished by some future and more philanthropic generation of men who will be able to devise means for the relief of poverty by some method which will elevate the masses of the poor rather than pauperize them.

Gladstone once said of O'Connell that his chief character-

istic was his passion of philanthropy. With the higher development of man there will arise a greater number of men whose hearts throb with that passion of philanthropy which will transform our present municipal and political systems into the nobler and purer systems where intelligence will rule and where the self-seeker must give place to the philanthropist.

THE HOUSES OF THE POOR AND THEIR LOCATIONS.

Even in the best modern houses, in the most sanitary districts of a city, we cannot protect human life from the pathological effects of the gross defects of our present system of drainage. The only partition between the atmosphere of our houses and the poisonous gases generated in our imperfectly ventilated sewers is a small quantity of water contained in the siphon-pipe which we call the trap. This is too often a death-trap. Other gases are absorbed by and pass through water, and it has never been proved that sewer gas also does not do so. In winter when our sewer ventilators are covered with snow our sewers are not ventilated at all, while our house-drains are not ventilated either in summer or in winter. Both house-drains and sewers should be thoroughly ventilated by means of drain ventilating pipes running up through the roof, and sewer ventilating pipes rising above the level of the snow.

The houses of the poor are very imperfectly ventilated. Built as they are, over dimly lighted and poorly ventilated cellars, or what is worse, no cellars at all, with no ventilation of the space beneath the floor; with small rooms, especially the bed-rooms, which ought to be the largest rooms; with low ceilings; with no mechanical means of ventilation; and with a general lack of intelligence amongst the poor regarding the deleterious effects of imperfect ventilation, one may expect, often to find a state of impaired general health, due to the effects of impure air. When one remembers that in addition to the insanitary condition of the houses of the poor, there is often scanty clothing, improper and insufficient food, together with debilitating anxieties and worries which are the concomitants of poverty, he is not surprised to find that the general health of the living is much impaired, and that the death-rate is much higher than that of those in more fortunate circumstances.

A dilapidated house upon an elevated spot on a farm or upon a choice villa site, with a permeable subsoil sloping towards the south, is a more sanitary residence than a brown

stone-front would be on the flat, low-lying, undrained soil, with impermeable subsoil upon which parts of most cities are built. For obvious reasons these are the parts usually inhabited by the poor.

A still more insanitary site is that found in almost all cities—the made lands—the lands which have been elevated from the beds of former streams and from swamps and marshes by the dumping of the detritus of the city during the days of less stringent sanitary laws. Such soil being super-saturated with moisture, contains no ground air, hence this organic matter continues to supply to successive generations the noxious effluvia of disease. In these undrained districts there is, of course, in the superimposed atmosphere an excess of humidity which greatly interferes with the action of sunlight; the electric tension of the atmosphere and also that of the human body is decreased; and the function of the skin as an excretory organ is impaired; hence the tone of general health becomes lower, hence a lessened force of vitality and therefore a lower resisting power against all forms of disease.

While such a condition is the predisposing cause of many diseases, it is especially so of pulmonary consumption, a disease so prevalent that it has been called the scourge of mankind. In 1897 ten per cent. of the deaths in London, England, were due to this disease; in New York twelve per cent. In the latter city 6,000 people die annually from this disease. At the end of 1897 New York had 20,000 cases. In former times it was considered to be hereditary, but it is now known to be a zymotic disease. Although the producing germ cannot be transmitted from parent to child, yet the lower vital tone is hereditary, hence in the children of consumptive parents, there is a lower resisting power against the inroads of the invading germ.

Although this disease is caused by a pathogenic germ, yet its predisposing causes are dampness, impure air, and lowered vitality. Health statistics of England and the New England States show that on flat, low-lying lands, with impervious subsoil, the death-rates from this disease are much higher than in well-drained districts having a porous subsoil. In Banbury, England, a thorough system of drainage has reduced the former death-rate from this disease 41 per cent.; in Rugby 43 per cent.; in Ely 47 per cent.; and in Salisbury 49 per cent. This death-rate declines in proportion to the distance from the coast. In Massachusetts and other States bordering on the Atlantic this death-rate is high. Going west it gradually declines until in Colorado it is only eight

per cent. and in Utah only 6 per cent. of all deaths; while on the Pacific slope it again increases with the decrease of the distance from the ocean.

The salutary effects of good drainage of the soil upon the health of the people may be seen in the higher physical development of the inhabitants of mountainous countries. While this is, of course, not the only cause, it is no doubt one of the chief causes of the more salubrious condition of mountainous regions.

Although both cold and warm damp climates predispose to consumption, yet the latter are the more injurious. Now, as a rule, the temperature of the houses of the poor is too high, that is, when they can afford the necessary fuel. While the cause of this, in a large percentage of cases, is insufficient clothing, it is no doubt very often due to a lack of knowledge concerning the injurious effects. To guard against this disease the essential requisites are a cool, pure, dry air for the lungs, and warmth for the skin, together with a proper and a sufficient amount of nourishment for the whole body. Given, a dilapidated house in an undrained district, built over a damp cellar, which is merely a marsh on a small scale (and all cellars in such districts are damp, if not built damp-proof; and they rarely are so built); with small, poorly ventilated rooms; with a too high artificial temperature in the house in winter, and a too high natural temperature in summer; with a scanty supply of proper food; and with insufficient clothing, and we have the best (or the worst) possible conditions for the propagation of this disease.

Besides, being a zymotic disease, it is of course infectious. In the older districts of all large cities, the majority of the houses have been occupied, during several generations, by many different families. This means that in a large percentage of these houses there have been cases of consumption. In Wards 4 and 6 in New York, 40 per cent. of the houses have been found to be infected. And the houses of the poor are very rarely renovated and not often disinfected.

Finding these conditions more or less common amongst 54 per cent. of the people of the United Kingdom, 40 per cent. of the people of the United States and 25 per cent. of the people of Canada, one can readily understand why so many contract this disease; and knowing how little can be done by Medical Science to check its ravages where it has gained a foothold, one can see why it has been called the scourge of mankind.

The most hopeful sign for its future control is the estab-

lishment of sanitariums for the isolation of phthical patients. But while a large percentage of the people continue to live under conditions which are favorable to the propagation of the disease, the effect of the isolation of those who have already contracted it will be limited. Only radical measures—the removal of the predisposing causes—will prove of much benefit.

THE HEALTH OF THE POOR.

Although the sanitation of the streets, lanes and yards of a city is a question of great importance, yet the sanitary state of the houses is of greater importance still.

The New York health report for 1897 shows that the highest death-rates occurred, not in the densest, but in the oldest districts of the city where there are still to be found the dilapidated houses, built, many of them, more than a century ago, before the days of Sanitary Science, and in which the owners have not yet seen it to be to their own interests to make modern sanitary improvements. For obvious reasons, the inhabitants of such districts are the poor.

In the districts of London where the Peabody Trust Co., and the Improved Industrial Dwellings Co., have provided sanitary houses for 50,000 people, the death-rate has been reduced from 26 to 16.

As an indication of the condition of the majority of the houses of American and Canadian cities it may be said that in 1894 in Philadelphia 82 per cent. of the houses had no bath-rooms. In the same year in New York 96 per cent. had none.

And in the cities and towns of Canada a large percentage of houses are defective in this, and in many other respects. In some of these cities and towns ten per cent. of the houses are without the convenience of closets. This means the existence of out-door privy pits with their death-dealing miasmata. In the districts in one large city where those abound, the death-rate in 1896 was 40—while in the better parts of the city it was only 13.

During the last half-century Sanitary Science has done much for the greater protection of human life. The death-rate of Glasgow in 1855 was 41; in 1895 it had been reduced to 35. That of New York in 1853 was 34, in 1897 it had been reduced to 19. With such unequal odds to contend against—poverty with over-crowding and other concomitants of poverty—Sanitary Science could not have been expected to do more.

In the propagation of all diseases, over-crowding has a baneful influence. In Whitechapel the density of human life to the acre is 300; in Bethnal Green 365; an area in Paris 430; Ward XI. New York 800. In districts in England where the average proximity of human life is 147 yards, the mean duration of life is 51 years; in Manchester, where this proximity is 17 yards, the duration of life is 29 years; and in Liverpool, where the proximity is only 7 yards, the duration of life is only 26 years. In districts in England with a density of human life of 650 to the square mile the death-rate is 20, and in districts with 6000 to the square mile the death-rate is 30. Taking 100 as the standard:—In 1896 in England and Wales the death-rate in the agricultural districts was 68; in London it was 114; in the industrial centres 124; that of farm laborers 63, and that of laborers in the industrial centres 150. In the two last rates occupation had a certain influence. Of the 31,000,000 of England and Wales 20,000,000 live in towns and cities. In Canada and the United States the percentage of the population is every year increasing in cities and towns.

Overcrowding and insanitation are not, however, the only causes of high death-rates amongst the poor. Prof. Seeley says:—"The prevailing diseases of the slums are diseases of society, being due to poverty and poverty being a disease of the state." In 1897 the death-rate of West London was 15, while that of East London was 21. That of St. George's district, W.L., was 12, while that of St. George's district E.L., was 27. That of Balsall Heath, Birmingham, was 15, while that of St. Mary's Ward, Birmingham, was 28. In 1896, in Montreal, the death-rate in what is known as "the city above the hill" was 13, while that in the poorer districts of the city was 50 to 150 per cent. higher.

This cruel, because preventable, tax on human life falls with immense over-proportion upon the poor and more especially upon the children of the poor. A certain disease of children, due to lack of proper and sufficient nourishment in an insanitary environment, is so common in England that on the Continent it is called "the English disease."

The children of the poor do not receive proper care. In London, in 1897, the death-rate of children under one year of age was 159 out of every 1,000 born. In the same year that rate in the industrial centres of England was 188. In giving these figures *The British Medical Journal* says:—"Until the children of women who must work in factories are sympathetically cared for and properly fed, this appalling infant mortality must remain a blot upon the sys-

tem of female factory labor." The editor might justly have added that female factory labor is a blot upon our civilization.

When Cobden first urged Mr. Bright to come to his help in the struggle for the repeal of the Corn-Laws his argument was that "Thousands of women and children in England are starving because of dear bread." In the very heart of our vaunted civilization of the present day, bread, although so cheap is yet too dear for very many who are too poor to buy, and so, thousands of overworked mothers sigh and weep while their half-starved and half-naked children sicken, and moan, and die.

In the days of chivalry the highest ideal of manhood was the gallant knight who held it to be his highest duty to do battle in the cause of helpless women and defenceless children.

It is difficult to witness the struggle for existence on the part of the masses of the poor in European centres and also in our large American and Canadian cities and still continue to be optimistic. But in the past mankind has been gradually tending towards a higher civilization. Not many years have elapsed since in English collieries women were employed to do the work of beasts of burden. The majesty of English law is now more humane, so that such inhumanity is no longer permitted. And in the future as in the past the tendency will be upward, and with more rapid strides, until humanity shall have reached that plain where the prime object of law will be, not chiefly the fostering of commercial enterprise and the protection of property, but the mitigation of human suffering and the protection of human life which is of such real worth that for its sustenance all material resources were created.

Although high death-rates are appalling, yet they are merely indications of the pitiable load of physical suffering which is continuously borne by the heavily-laden poor. Even death brings with it its consolations. But for the physical suffering of those who survive the attacks of disease there is in the slum life of cities no brighter prospect than probable future suffering with little consolation, with limited means of prevention, and with no means of redress.

In his Edinburgh address Lord Lister said:—"I regard all worldly distinctions as nothing in comparison with the hope that I may have been the means of reducing in some degree the sum of human misery." When all physicians, clergymen, and legislators shall have risen to that unselfish and Christ-like ideal of life what extensive and largely neglected fields they will find in the slums of all large cities! The reward of their labors will be greater than all worldly distinctions.

POVERTY ONE OF THE CHIEF CAUSES OF INSANITY.

The increase of insanity during the past few years gives a new force to the old maxim :—" *Mens sana in corpore sano.*" The popular impression amongst the laity is that that increase is due to the increased use of alcoholic beverages; but although in numerous cases of insanity alcohol has been the cause, yet it is only a secondary cause. In the past, physicians have usually considered heredity, alcohol, specific disease, undue mental exertion, and the worries of business life as the causes of this increase of insanity. But the chief increase has been amongst the poor, with whom heredity has no greater force than amongst other classes. Their life does not call for greater mental exertion, neither do they expend more mental energy in the worries of business life, while it would be difficult to prove that they indulge in greater excesses *in baccho et venere*. But the standard of physical health amongst the poor is very much lower than that of other classes, with greater mental depression, and with more limited opportunities for that mental recreation which is so essential to mental health.

That the effect of poverty is the chief cause for the increase of insanity will, to many readers, appear so extremely incredible that other and higher authority must be cited.

Horatio Wood says:—"Insanity bears a close relation to physical disease. The latter impairs and exhausts the nutrition of the brain centres. This exhaustion and impairment, together with lack of proper and sufficient nourishment, is capable of causing mental disease."

Eskridge says:—"Any cause which interferes with the proper nutrition of the body and consequently of the brain predisposes to nervous break-down and therefore to pronounced mental disease."

Osler says:—"The chief cause of insanity is that life so common in large cities—so well expressed by the phrase:—'burning the candle at both ends.'"

Mickle says:—"Physical disease, hardships, starvation or any other cause which tends to lower the nutrition of the higher nerve centres in the brain may produce weakness of the will, and when a man's will is too weak to control his emotional nature he is to that degree insane."

Some of these conditions exist, it is true, amongst all classes, but all of them, and to a much greater degree, amongst the poor.

In his address on Psychology, read at the July, 1898, meeting of the British Medical Association, Sir John Batty Tuke, Prof. of Mental Diseases in the Royal College of Edinburgh, says:—"Nulla mens insana nisi in corpore insano, expresses the principle which is regulating our conception and our practice in respect of all the conditions comprised under the generic term insanity."

A large percentage of men and women are so weakly endowed mentally as to be wholly unfit for any but the most primitive form of citizenship. With quiet natural environment they could pass life in full possession of their normal mental powers, but subjected as they are to our complex modern civilization, which requires greater mental energy and activity to gain a livelihood, they weaken and falter in the struggle, sink into the pauper ranks, which are the recruiting camps from which we draw our ever increasing army of the insane.

In 1859 the number of lunatics in England and Wales was 36,700, one to every 536 of the population. In 1896 that number had been increased to 96,400, one to every 319 of the population, an increase of 162 per cent., while the population during that time increased only 56 per cent. During that period the pauper class of lunatics increased 178 per cent., while the private class—the well-to-do—increased only 76 per cent.

In London in 1896 the number of pauper lunatics was 19,254. In 1897 that number was increased to 19,954—an increase in one year of 700, or nearly four per cent., while during that year the population increased only three-fifths of one per cent. In that year there was no increase in the number of private lunatics.

In Canada and the United States statistics show a still greater increase of lunatics in proportion to the increase of population, but owing to the fact that until quite recently we had no regulated system for the compilation of statistics no fair comparison can be made. But we have figures sufficiently reliable to show that the increase of insanity in Canada is such as to be a cause of some anxiety to those who are interested in the future well-being of the State.

The British Medical Journal of July 6, 1898, says:—"Lunatics are increasing at an alarming and an astonishing rate. This is becoming so grievous a burden that the popular mind is ripe to consider seriously and practically whether there must not be something wrong in a system which gives such appalling results."

Henry George says:—"Almshouses and prisons are just as surely the marks of what we call material progress as are rich warehouses and palatial residences." With almshouses and prisons Henry George might have included lunatic asylums.

In England the value to the State of every life is estimated to be £159. In Canada that estimate is \$1,000. In England the expense to the State for the support of each pauper lunatic is four shillings per week. In Canada that expense is higher. From these figures calculate the loss to the State of all these human lives, then calculate the expense to the State for the support of these pauper cases for the remainder of their blank existence, then estimate the amount of untold sufferings which every case of mental aberration entails, and then weigh the enormity of the cause to which such deplorable results are largely due, a cause which is every year producing more baneful effects and which must continue to do so until we shall attain to a higher civilization than is possible under our present competitive economic system, whose tendency is to develop still further the selfish nature of man and thus to retard the development and the advent of that more Christ-like man who will live not so much for self as for others.

ALCOHOL AND HEALTH.

Like many other evils, the injurious effects of intemperance are greater amongst the poor. The Registrar-General's returns show that in Scotland, in 1897, the number of inebriates in the small towns, villages and rural districts was one in every 3,200 of the population, while in the large towns and cities the number was one in every 1,000. Amongst the wealthy and cultured classes in the large towns and cities, the percentage of registered inebriates is very small. This means that the percentage of inebriates amongst the poor of the large towns and cities is very large.

The indiscriminate use of Alcohol being one of the most common causes of disease, a paper on the abuse of alcohol will not be out of order in a series of papers on Sanitary Science whose province it is to investigate all causes of disease.

Like *nux vomica* and many other drugs, when used in proper doses, and in cases of disease where its use is indicated by pathological symptoms, alcohol is a medicine; but when used, even in medicinal doses during normal health, when no medicine is required, or in over-doses at any time, it in-

terferes with the action of physiological laws which control the functions of the organs of the human body, and in so doing it acts not as a medicine but as a poison. Its supply to the people should therefore be controlled by laws just as stringent as those which govern the prescription of all other dangerous drugs.

In certain forms of dyspepsia, alcohol in medicinal doses stimulates the function of the digestive organs, but in too many of such cases its use in therapeutic doses is only a first step towards its promiscuous use, which is rendered possible by our present lax system of license law.

Being a cardiac stimulant, alcohol makes the heart beat faster and stronger and thus gives a feeling of increased strength. But this feeling is delusive. It does not increase the strength. It acts merely as the whip to the horse. It excites into action the reserve force already existing. Now in certain cases of acute disease, where there is danger of a fatal issue from heart-failure, the physician at times takes advantage of this effect of alcohol. But in normal health this effect is not only not beneficial but injurious, as it calls forces into action which is invariably followed by re-action, forces which never should be excited except in cases of extreme emergency. Athletes in training and soldiers on long marches show greater powers of physical endurance without alcohol. In the recent Soudan campaign, Kitchener's army marched across vast reaches of desert, under a burning African sun, and then fought Omdurman. And they fought it well. With their rations there was no supply of alcohol.

The action of alcohol upon the general circulatory system is to paralyze the inhibitory nerves which control the calibre of the capillary blood-vessels of the surface of the body. The result of this paralysis is that these vessels become dilated and receive a larger-than-normal supply of blood. But a larger supply of blood to the surface of the body means a smaller supply to the more vital internal organs. This increase of blood in the skin gives the impression of increased heat—an impression which is deluding, for the larger quantities of blood coming into close contact with the atmosphere, the heat of the body is more rapidly radiated. In certain acute diseases with high temperature, alcohol is used medicinally to effect this loss of heat, but in normal health this decrease of heat in the system is not only unnecessary but extremely hurtful.

Besides, by its action in retarding the process of heat-production in the body, alcohol acts still more deleteriously. The

heat of the body is produced by combustion—that is, by the union of the carbon which is supplied by our food, with the oxygen of the air which we breathe. The action of alcohol is to contract the red cells of the blood, which are the oxygen carriers. The contraction of these means a decrease in the size of the burdens which they are capable of carrying, hence a decreased supply of oxygen to the system, hence retarded combustion and therefore a more limited heat-supply. Arctic explorers invariably find that men exposed to extremely low temperatures endure the intense cold more easily and more safely without alcohol.

But this limited supply of oxygen has still more baneful results. During the process of metabolism in the body there are produced in the blood waste products, which, if retained in the system, invariably cause disease. Now the chemical difference between urea and uric acid is only an atom of oxygen. In a system having a full supply of oxygen this atom combines with the insoluble uric acid to form the soluble urea which is readily carried out of the blood by the excretory organs, but in a system with a limited supply of oxygen the uric acid is not thus transformed, and, being insoluble, it cannot be excreted, hence it must remain in the system, where it produces a class of correlated diseases whose victims are every year increasing in numbers. Another effect of this interference with metabolism is an increase of flesh—that is of fatty tissue, which increases the body weight, thereby destroying the normal equilibrium between the weight of the body and its muscular power. This increase of flesh denotes not health but disease.

The general effect of alcohol upon the human body is to lower the vital tone of the system. This means a lower resisting power against the onset of disease, as well as a weaker resistance against the progress of disease after its onset. An examination of the case reports of our hospitals very soon dispels all doubts we may formerly have had concerning the higher comparative death rates amongst those addicted to the moderate or excessive use of strong drink. Every experienced physician has more hope for the recovery of serious cases of acute disease where there is no history of the use of alcohol. During the past few years the officers of life insurance companies have discovered the fact that for total abstainers there is a longer expectation of life. The statements of life insurance officers and of physicians are substantiated by statistics which show that every year in Canada, one result of the legalized traffic in strong drink is the pre-

mature death of about 5,000 men. The value to the State of every life is said to be \$1,000. The revenue from the liquor traffic is \$8,000,000. To permit, for the sake of the remaining \$3,000,000, the continued existence of a cause which has so disastrous results to human life, is entirely inconsistent with the principles of legitimate business and with the Christian sentiment of a developing civilization; and to permit the weak and the ignorant to continue to do themselves bodily harm and to be imposed upon by avarice and by a so-called liberty, which is the most relentless bondage, is in harmony neither with the genius nor with the majestic and benevolent aegis of English law.

ALCOHOL AND INSANITY.

In the sixth paper of this series it was stated that in the causation of the present increase of insanity alcohol was only a secondary cause. But secondary causes are at times very serious causes, and in this case this is especially true.

The use of alcoholic beverages, either in excess or in moderation, invariably results in the impairment of the physical health upon which the mental health so very largely depends.

Sanity is a perfectly adjusted balance between the will and the emotional nature. Any cause which weakens the power of the former or unduly develops the latter plays a part in the production of insanity. Alcohol in larger than medicinal doses has both of these effects.

The heart is kept in motion by the nerve current carried along a motor nerve, and it is kept in check by the current conveyed by an inhibitory nerve. When we stimulate the former or paralyze the latter the heart goes too fast. When we stimulate the former and paralyze the latter it goes faster still. If this stimulus and paralysis be continued the result is heart-disease.

Now alcohol paralyzes the will whose regal function is to control the emotional nature. This sceptre dethroned, the emotions run rampant. When, in addition to this paralysis of the will, the emotional nature is stimulated, the human brain—that masterpiece of creation—becomes a mere mass of nervous protoplasm run mad. This condition is insanity, temporary or permanent.

Alcohol plays a similar part in the paralysis of conscience and in the stimulation of the lower animal nature of man. But this question belongs to the domain of the theologian and not to that of the physician.

So permanent and ineradicable are the effects of alcohol upon the mental nature, that in a large percentage of cases retribution comes in later life in the form of alcoholic dementia as a result of inebriety during earlier years. The case-book of every experienced physician contains reports of cases of insanity beginning in later life where the only assignable cause was dissipation during the years of earlier manhood.

The Professor of Mental Diseases of Edinburgh University says:—"I have known cases where men had drunk hard in youth, with apparent impunity and stopped drinking about 40. Yet after 50 they passed into alcoholic dementia." And such results are not confined to those whom we call drunkards. Even the more moderate use of alcohol as a beverage interferes with the natural laws which guard the health of the mind. Neither physical nor mental health-laws can with impunity be ignored. Nature punishes every breach of every law of her realm. The Superintendent of the Royal Edinburgh Asylums, in a paper read before the recent meeting of the British Medical Association says:—"A common case is that in which a man has from his youth, but not to excess, indulged in alcohol stimulants, which had no appreciable effects until he reached the age of forty-five or fifty years, when, all at once, in two or three years, his eye became bleary, his hand shaky, his morals less upright, his memory dim, and his mind gradually became a blank."

Dr. Benjamin Ward Richardson says:—"The moderate drinker is more likely to curse his children with an inheritance of epilepsy, idiocy or insanity than the man who indulges only in periodical debauches."

A man, who in his own mind or body pays the penalty of former misdeeds, is pitiable, but he whose sins are visited upon his offspring—upon innocent and irresponsible little children—not only fails to rise to the grander possibilities which existed in his own life, but hands down to future generations a devastating inheritance to dwarf and destroy the mental, moral and physical lives of others. The latest recorded statistics of the asylums of Iowa show that of imbecile children, 90 per cent. of the cases are due to heredity, and that of this 90 per cent. 73 per cent. are descendants of inebriate ancestors.

"They enslave their children's children
Who make compromise with sin."

Medical science now regards dipsomania as a mental disease—that is, an atrophy of the will, with a corresponding ab-

normal development of the emotional nature. Being a disease of the mind, it follows that its victims are entirely irresponsible for acts which our laws call crimes. The incongruity of our present system of law is that it legalizes the supply of the alcohol which produces the disease, and then punishes as crimes the manifestations of the disease—and this in order that the majesty of law may be maintained inviolate.

Every succeeding year, larger sums of money are being expended in the protection of human life against accident, violence and disease—an increasing expenditure which denotes that the value of human life is being more fully recognized as we rise to a higher civilization. On the other hand, we continue to legalize a traffic which produces physical disease, moral delinquency and mental imbecility—and this for the sake of a few millions of revenue, while we expend many millions in the building, equipment and maintenance of hospitals, prisons and asylums for the convenient disposal of the victims of the traffic which we legalize.

Twenty years ago, Justin McCarthy, in his "History of Our Own Times" made the prediction that:—"We are at that stage in the development of responsible government where we shall very soon see the beginnings of legislation to interfere with individual right." But at the present time, in Canada, where the battle of responsible government was, sixty years ago, fought and won, we still grant that individual right should be paramount, that avaricious men should have the right to supply that which produces moral degeneration, mental aberration and physical disease, and that weak and ignorant men should have the right to ruin themselves, and to wreck the homes of weak women and helpless children. If by a harsh economic system we must make it necessary for the poor to live in the slums where the saloons outnumber the churches, the least we can do is to improve their moral environment, so that it will be less impossible for boys and girls to grown up to be temperate men and women.

Men of broader views and larger sympathies see that our own individual right ends at that point where that of our neighbor begins, and are hoping, praying and striving for the advent of that more righteous day when man will be faithful to his divine commission as the keeper of his weaker brother, and when this present self-seeking order of men will give place to that new order—the brotherhood of man.

"For mankind are one in spirit,
 And an instinct bears along
 Round the earth's electric circle
 The swift flash of right or wrong.
 Whether conscious or unconscious,
 Yet humanity's vast frame,
 Through its ocean-sundered fibres,
 Feels the gush of joy or shame.
 In the gain or loss of one race
 All the rest have equal claim."

LIFE IN CITY SLUMS.

The province of Sanitary Science is strictly limited to the physical, but as there often exists between insanatory conditions and immoral tendencies the relationship of cause and effect, it may be permissible in this paper to overstep the bounds of sanitary science proper and to refer to the immoral influences of a bad physical environment upon men and women and more especially upon the more susceptible children.

A leading historian says:—"Crime is merely a symptom of a condition of things in the political framework of society which calls for remedy rather than repression." His statement appears incredible, and yet it may be that there is more truth in it than we are capable of seeing. Recent statistics show that of the 6,000 criminals of a single year in New York, 51 per cent. came from homes whose houses were reported "in bad condition," while only 9 per cent. came from homes whose houses were "in good condition." Similar figures might be tabulated in all other large cities. Such figures show, not so much the baneful influences of the dilapidated houses themselves as the degenerating influences of the slum environment in which these houses stand.

The great importance of the question of the housing of the poor cannot be fully realized until we weigh the immoral effects of pernicious physical causes. Prof. Rogers says:—"The houses of the people are one of the chief factors in the determination of our present and future civilization. Our present economic system results in supplying, every year, an increasing number of the victims of slum life as inmates for our hospitals, almshouses, asylums and prisons."

Dr. Reiss says:—"The recent increase of crime in American cities is no more a cause for surprise than is the excessive mortality in the houses of the poor. The dilapidated condition of the houses of the slums and the barbarity of slum environment account for both. From the masses of humanity huddled together in the slums of our large cities there comes forth every year an army of physical degenerates and moral delinquents to prey upon society."

Huxley says that if Milton and Shakespeare had been born and reared amongst savages they also would have grown up to be savages. He adds that in his study of the social condition of many races of men, including Bushmen and Patagonians, he had found no people in a more deplorable social condition than the denizens of the slums of East London.

In his "Tales of the Selkirks," speaking of the slums of Edinburgh, Ralph Connor says:—"Cowgate, redolent of the glories of the splendid past and of the poisonous odors of the evil-smelling present! Is this the beautiful, the cultured, the heaven-exalted city of Edinburgh? Will she not for this be cast down into hell, if she repent not of her dens of physical and moral defilement? O the utter weariness, the dazed hopelessness of those ghastly faces! Do not the church-going folk of the crescents and gardens see them in their dreams, or are their dreams too heavenly for such ghastly faces to appear?"

Who are responsible for the continued existence of the slums? It is certainly not the innocent and irresponsible little children who are compelled by dire circumstances to live in them, and yet the children with all the higher possibilities of their natures are the greatest sufferers from the debasing influences of slum life. The placing of that responsibility and the remedy, constitute present sociological problems, which are in Europe and America, beginning to demand solution. General Booth has suggested and attempted what seems to be the logical solution—the depopulation of the slums.

Has Christianity any solution for these problems? If not, Christianity would be unequal to human needs. Theoretical Christianity does not know of the existence of these problems. Applied Christianity offers the only solution.

"Said Christ our Lord, 'I will go and see
How men, my brethren, believe in me.'
Great organs surged, through arches dim,
Their jubilant floods in praise of Him,
And in church and palace and judgment hall,
He saw His image high over all.
But in church and palace and judgment hall,
He marked great fissures that rent the wall,
Which opened wider and yet more wide
As the living foundations heaved and sighed.
Then He sought out an artizan,
A low-browed, stunted, haggard man,
And a motherless girl, whose fingers thin
Pushed from her faintly want and sin.
These He set in the midst of them,
And as they drew back their garment hem
For fear of defilement, 'Lo here,' said He,
'The images ye have made of Me!'"

PHYSICAL DETERIORATION.

A half-century ago, Malthus suggested a solution of the problem of the gross and cruel sacrifice of human life in city slums. He said:—"The tendency of the increase of population is to bring into the world human beings for whom nature refuses to provide, and who have therefore no right to any share in the necessities of life, whom she tells as interlopers to be-gone; and she enforces obedience to her commands, employing as her agents, hunger, war and life-destroying pestilences."

During the intervening fifty years, humanity has been making progress towards the ideal life, and yet even in this more enlightened generation we sometimes find men, who, while professing to belong to a higher order of manhood, are, in principle and in life, Malthusians.

Now the solution offered by Malthus means that Nature brought these beings into life, and subsequently discovered that in so doing she had made a mistake, and therefore refused to provide for them. But Nature makes no mistakes. Malthus was not capable of seeing that Nature was consistent, but that unjust laws, made by fallible men, in the darker days, when might was held to be the only right, had fixed an impassable gulf between Nature and the majority of her offspring so that she could not provide for them. Neither could Malthus see that the life-destroying agents, hunger, war, and pestilence, had been commissioned not by Nature but by man.

Malthus still has his disciples. There is a school of so-called evolutionists who teach that our present competitive economic system, which is merely a strife between man and his neighbor for economic superiority, is a means for the mental and physical development of man, by a process which they call the survival of those whom they erroneously call the fittest.

Darwin taught the evolution of higher from lower forms of life by the process of natural selection—the weaker, if not destroyed by the stronger, being left to extinction, having no opportunity of propagating their kind, or not being adapted to their environment. Now amongst bears and tigers such a system is natural. They struggle for the self-life. If man had none of the higher hopes that make us men, that system might be justifiable even amongst men. The higher man struggles for the lives of others. Besides, by Darwin's process there has been a continuous development. Granting that by means of this system man is being developed mentally and

physically, it has not been proved that he is at the same time developing morally and spiritually. Statistics which show the recent increase of that class of crimes whose motive is the acquisition of money, would seem to indicate that man is *not only not developing* morally and spiritually, but that he is *retrograding*. Unsymmetrical development is not true development.

It would be difficult to prove that under our present economic system there has been even mental and physical development. Physically, we do not compare favorably with our Viking ancestors, not even with the Maoris and other savage peoples of our own times. Dr. Farr's tabulated figures show that the economic condition of a large percentage of the people who live in cities and towns accounts for this decline. These figures show that, in Glasgow and Edinburgh, the average stature is two inches lower than that of the Scottish peasantry, the average chest measurement three inches less, and the average weight twenty pounds less. In Belgium, Germany and France there are corresponding figures. Any one visiting the industrial centres of England would need no figures at all. Dr. Farr's figures show also that during the last half-century the mean expectation of life has been diminished. At 30 years of age, the mean expectation of life in 1841 was 33.1 years. In 1891 that had declined to 32.5. At the age of 40 years, in 1841 it was 26.5. In 1891 that had declined to 25.4. At the age of 50 years, in 1841 it was 20. In 1891 that had declined to 18.8.

These figures are emphasized by the fact that, during that half-century, Sanitary Science made her most rapid strides in the greater protection of human life. Had all other things been equal, the expectation of life in 1891 would have been greater rather than less than that of 1841.

Those who claim a recent physical development of man are unscientific, inasmuch as they merely make arbitrary statements without proof figures. Amongst the poor, who are an ever increasing majority, such proof figures do not exist. Neither do they exist amongst the wealthy. As a direct result of luxurious living there is physical decline amongst that class also. The *British Medical Journal* says:—"It is a question whether our ancestors were not physically better fitted for survival than their posterity. There is nothing irrational in the proposition that our devotion to comfort and aestheticism, the direct result of our present civilization, may tend to loss of vitality and vigor and, ultimately, to a gradual physical decline."

In his "Primer of Evolution," Edward Clodd says:—"The history of mankind, with its degenerative races, Bushmen, Fuegians and others, with its relics of an ancient civilization, whose arts we can only feebly imitate, and whose types of manhood we cannot hope to excel, furnishes its monitions of the lethargy and love of ease which invariably precede the downfall of peoples and nations."

THE PEOPLE AND THEIR RELATION TO THE SOIL.

The object of this series of papers has been to endeavor to show that the chief cause of the greater prevalence of physical disease and of the higher death-rates amongst the poor is that they are separated from nature by being largely concentrated in congested centres of population where poverty with all its insanatory concomitants prevails, and where insanitation is as prevalent as poverty. That this unnatural life of an ever-increasing majority is the direct result of our economic system, more especially of our system of land tenure, not many who have studied the question will deny. The effects of this system are of course more palpable in the older lands across the sea.

In 1685 in Great Britain, according to figures given by Macaulay, 15 per cent. of the people lived on land of which they themselves were the owners. At the present time in Great Britain 85 per cent. of the land is owned by 1-2400 of one per cent. of the population, while 67 per cent. of the people are crowded into the unhealthy life of city and town, and 30 per cent. of those are over-crowded in the poverty-stricken and pestilential slums. 1,000 of the wealthiest land-owners of Great Britain own 30,000,000 acres while one in every twelve of the population is a pauper, while 25 per cent. of the people live in dilapidated houses, and while 70 per cent. of the people are separated by so narrow a margin from destitution that a few weeks' sickness or loss of wages brings them face to face with absolute want.

The soil was created for the support of the people and yet the majority of the people must struggle in order to gain a very limited supply of the bread which the soil would produce if the people's inherent right to the soil were acknowledged. Thousands of helpless little children are suffering and tens of thousands of them dying every year, because of the lack of an adequate supply of that nutriment which the soil was designed to supply, because of the lack of the disin-

fecting ingredients of the soil which would destroy the pathogenic germs which cause infectious disease, and because of the lack of the health-giving fresh air and sunshine which is unavoidably monopolized by those who monopolize the land.

Before Dr. Paton became a foreign missionary he was the minister of a parish whose people were a sturdy Scottish peasantry living in happy homes where, on their small but well-cultivated farms, they were making a comfortable livelihood for themselves and their children. Upon his return from the foreign mission field he found the parish depopulated—every home having been razed to the ground to make room for deer and grouse. He found many of his parishioners suffering and dying amidst the poverty and pestilence of the close and wynds of Edinburgh and Glasgow.

From a superficial view it would appear that the prevailing poverty of the slums is due to the prevailing intemperance. Is intemperance the cause or is it a result? Before they were driven into contact with the moral and physical contamination of the slums, Dr. Paton's parishioners were thrifty and sober people. Uninfluenced by the degenerating environment of slum-life their children also would have grown up to be thrifty and sober men and women.

During his life in the South Sea Islands, while studying the social condition of the savages, Dr. Paton had found that one of their fundamental economic principles was that they would not sell the land upon which they lived because they would not sell the inherent right of their children to the land upon which they were born.

In America our system of land tenure has not yet resulted in such baneful effects as are to be seen in Great Britain, but similar causes in America will ultimately produce similar effects.

While the land in Canada and the United States is more generally owned by the people, the distribution of wealth is equally unequal, and, many would say, inequitable. While, in New York, there are 1,103 millionaires, upwards of 1,000,000 people live in the slums enduring the moral atrophy and physical deterioration which slum life entails. While there are in New York men with an income of a million a month, there are also poor widows whose only means for the support of themselves and their children is the making of shirts at twenty-five cents a dozen, supplying their own thread. While a young woman on Fifth Avenue spends \$10,000 in laces and diamonds to wear at a \$50,000 banquet and ball, a homeless girl in the Bowery, defeated in her battle against want, and against sin

which in her case was the result of want, rushes to self-destruction

"Mad from life's history, glad to death's mystery,
Swift to be hurled anywhere—anywhere out of the world."

In 1897 in the same city 3,819 persons who had lived the lives of paupers and died the death of the pauper were buried in the Potter's Field.

The signs of our times point, distantly perhaps, but not indistinctly, to the advent of a more humane civilization, under the protection of which the Church can say to the members of trusts and combines and to all others, whose increasing riches cause increasing poverty, that, as self-seeking proprietors, their business principles are no longer in harmony with the altruistic principles of a Christian age, and by the authority of which, the State can say that henceforth individual right must give place to the divine right of the people.

With the onward and upward march of the ages the world is being more fully prepared for such legislation. Every succeeding year brings nearer the time when law, while still retaining its majesty, will become more humane. The first rays of the dawn of that day have already begun to penetrate and dispel the benightment of human selfishness. At the full dawn of that day every rood of ground will maintain its man,

"His best companions, innocence and health."
The full noontide of that day will

"Ring out the feud of rich and poor,"
because it will

"Ring in the nobler modes of life,
With sweeter manners, purer laws."

LEGISLATION.

In the last paper of the series on Sanitary Science it was said that the greater amount of physical suffering and the higher death-rates amongst the poor of the city slums were the direct results of our present system of land tenure which denies the inherent right of the people to the soil which would produce an ample supply of bread for all whose supply is now limited, the cultivation of which would provide healthful occupation for many who now cannot find employment, and the life upon which would give slum children an unlimited supply of fresh air and sunshine, for the lack of which they now pine and sicken and die. It was said in the same paper that

with the advent of a higher civilization, there would be enacted a more benign legislation which would acknowledge this inherent right of the people to the soil.

Many good and wise men would look upon an agitation for such legislation as synonymous with socialism and anarchism. It is argued by these that the only proper means of effecting political reform is by the regeneration of the heart of individual men.

Due weight must be given to this view. There cannot be too much done for the enlightenment of individual men. But when this is accomplished on a large scale—when the national life is really affected thereby—it will manifest itself by the enactment of wholesome and righteous laws. And these laws as the outcome of the intelligence and conviction of the majority of the people will become potent educative agencies.

One of the chief differences between civilization and barbarism is that under the former there are laws upon the statute books which interfere with individual right. All the great reforms which have transformed the crude civilization of the Ancient Briton into our higher Anglo-Saxon civilization have been initiated by legislation. The Great Charter of English liberty was secured by the agitation of the English Barons of the 13th century. That Charter is merely the legislation which those barons compelled King John to enact.

The majority of good and wise men in the days of Chartism looked upon that agitation as extremely unwise, and yet all the great principles for which Chartists contended are now embodied in English law. The reforms enacted by those laws would not so soon have come but for that agitation which exposed existing evils and taught the people how those evils might be remedied.

In the days of American slavery the slaveholders believed that slavery was just. The majority of their religious teachers in the Southern States taught them that it was in harmony with the teaching of divine revelation. Had Lincoln and other abolitionists waited for the higher moral development of the individual, the slave might yet be in bondage. But in the Northern States a few men, with a firm conviction that the love of neighbor and the brotherhood of man were fundamental principles of Christianity, began an agitation which culminated in that legislation which abolished slavery. That agitation was the education which moulded public sentiment and aroused the public conscience to such an extent that a half-million of men were willing to give their lives in order that the slave might be set free.

Legislation *per se* is a means of educating public sentiment. The more humane system of land laws of the Mosaic code was legislation. The Decalogue was legislation.

Did the divine inspiration of holy men end with the words of the Seer on Patmos? Whence the holy fire that glowed in the hearts and upon the lips of Bright and Cobden, when, by words of burning eloquence, they aroused the conscience of the English Commoners to see the wrongs inflicted upon thousands of women and children, who were starving on account of the high price of bread? And in our day, in professorial chair, in pulpit and in legislative hall, are there not men worthy of being called up into the Holy Mount, to stand in the presence of Jehovah, and to receive on the tables of their hearts an impress of the Divine will? And will not these prophets be faithful to their divine commission in communicating to the people this revelation, with its true interpretation, so that the laws of men may become more in harmony with the will of God, and so that the present system of unchristian commercial strife between man and his neighbor may make room for the coming of that Kingdom whose fundamental laws are love and peace?

“Peace, beginning to be
 Deep as the sleep of the sea,
 When stars their faces glass
 In its blue tranquility;
 Hearts of men upon earth,
 That have rested not from their birth.
 Shall rest as the wild waters rest
 With the colors of Heaven on their breast.
 Love, which is sunlight of peace,
 Age by age shall increase
 Till anger and hate are dead,
 And sorrow and death shall cease.”

PALESTINE
 1890-1891